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ABSTRACT

Presented is a design for a data recording sheet which is claimed to be flexible, simple, time-saving , and convenient for classroom teachers to use. It is explained that scoring indicates criterion level, number and pattern of correct and incorrect responses, and a linear graph of the student's ongoing performance. (CL)

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A MULTI-PURPOSE DATA SHEET FOR RECORDING AND GRAPHING IN THE CLASSROOM

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A MULTI-PURPOSE DATA SHEET FOR RECORDING AND GRAPHING IN THE CLASSROOM[1]

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Concurrent with the present emphasis on extending special education services to the severely handicapped, there is the continuing effort to insure that whatever services are delivered are of high quality. Today, "high quality" is often equated with effective teaching strategies, functional training programs and management by objectives. For each of these aspects of the educational program, there are now available to the classroom teacher a large number of carefully developed and well-tested programs or systems. Although many of these can be implemented with a modicum of preparation or inservice training for the teacher, their effectiveness is often less than what would have been expected.

Both direct experience and anecdotal feedback have suggested to the authors that much of the reduced effectiveness was related to the incorporation of heavy requirements for data collection and performance monitoring within the format of these programs. Interestingly, it is this same commitment to a data oriented or systematic analysis of behavior which led to the development of these innovative teaching strategies and which is essential to their effectiveness. Thus, the solution lay, by necessity, in simplifying the mechanics of the data collection system rather than in modifying or abandoning the training programs.

Specifically, a data collection system was required which would have five essential characteristics: 1) It could be used independently by a classroom teacher who did not have access to support personnel for observation and recording purposes, 2) It could be used during training or instructional periods without significantly slowing or disrupting the teaching procedure, (3) It could be used conveniently to record the

performance of more than one pupil at a time, 4) It would be adaptable to more than one or two areas of instruction, 5) It would reduce the time normally required for data consolidation and graphing.

Data Sheet

Based upon an earlier design of a data sheet developed by the authors for collecting data in single-subject research or training, the present design was developed for the classroom teacher. As shown in Figure 1, the data sheet consists primarily of repeated columns of numbers, each column ordered from bottom to top, from zero to 20. The columns are divided into three blocks of eight columns each. Each block serves as a separate recording space for each pupil in the group as designated by the names entered above the blocks. Additionally, the tilted lines above each column provide space to enter reference information. Below each block, the columns are numbered from one to eight. To the extreme right, a column of numbers is provided which represent the percentage equivalents of each numeral in the columns. Space is provided below the recording blocks for entering comments or notes.

Procedure

The data sheet is used primarily for recording the correct and incorrect responses of students on tasks which involve presenting each student with 20 trials, attempts, or questions per day or per training session. The teacher prepares the sheet prior to the training session by first entering the names of the students above the recording blocks. The data of training or reference information (to be discussed below) is

Names: Billy Susan John

DATE OR ITEM

Oct 27 | Oct 28 | Oct 29 | Oct 30 | Nov 3 | Nov 4 | Nov 5 | Nov 6

Give me | How many | Give me | How many | Give me | How many | Give me | How many

Red | Blue | Green | Purple

Comments:

Fig. 1. Sample data sheet with data to show representative usa

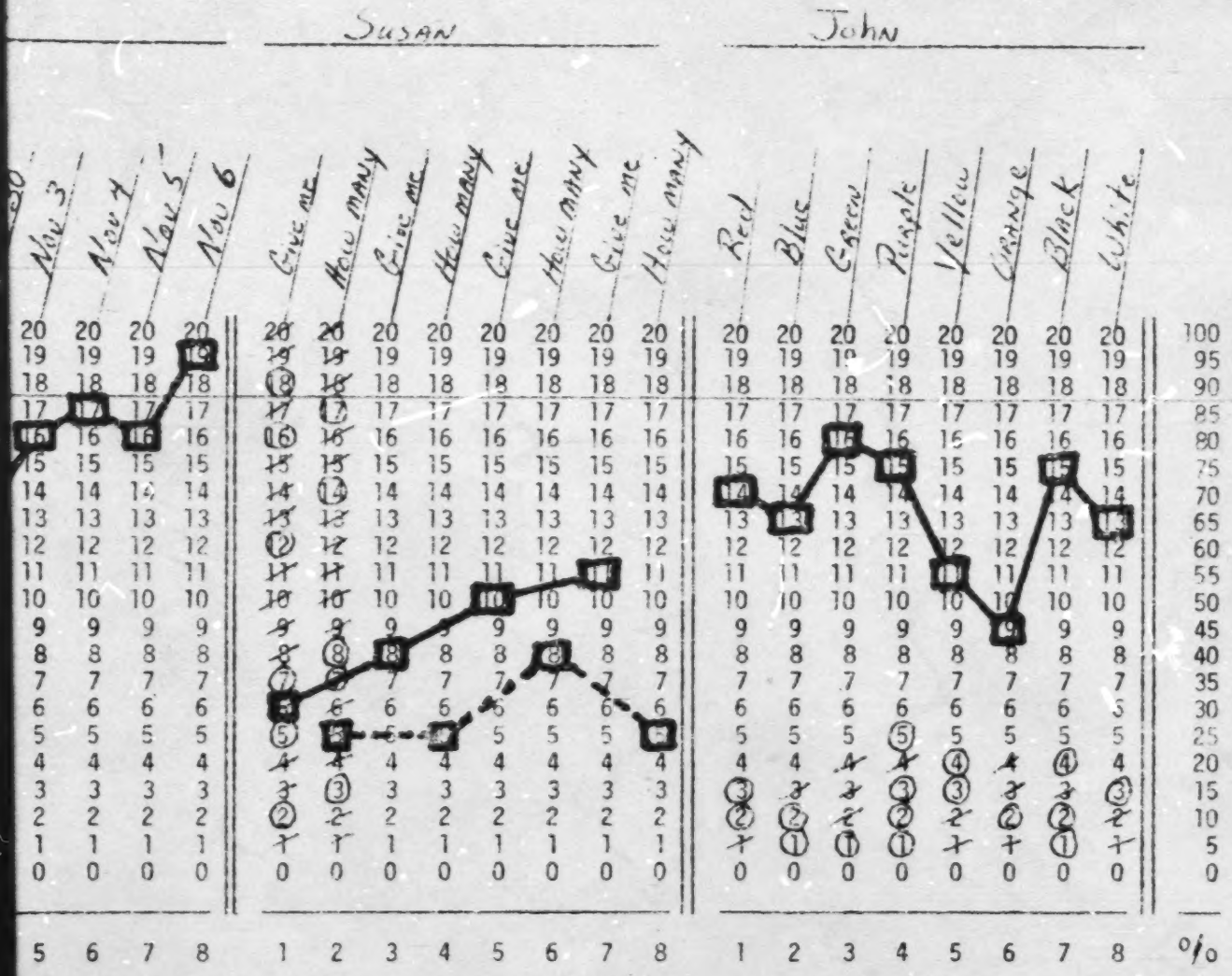

Fig. 1. Sample data sheet with data to show representative usage.

then entered above the appropriate column in the tilted-line spaces. Finally, a criterion performance indicator line is drawn across the data sheet. This line is used to indicate the number (or percent) of correct responses required of the student for one or more days before the student's training program is changed. In Figure 1, the indicator line is drawn across the sheet just below the numeral 18 in each column.

Scoring the responses of each student is accomplished by drawing a slash through a numeral for an incorrect response or by circling a numeral for a correct response. Each numeral in the column, beginning with the numeral 1, corresponds to the number of the trial or attempt through a total of 20 trials. By scoring 20 trials in this way (e.g., column 1, under Billy in Figure 1), the pattern of correct responses through the training session is apparent by looking at the pattern of circled numerals.

Graphing the data collected in the above manner is accomplished on the data sheet itself at the end of each day. The teacher first counts the number of correct responses made by the student that day. Then, as shown in Figure 1 under "Billy," a square is drawn around the numeral equal to the toal number correct, and that square is connected to the preceding square (previous day's total correct) in graphic style. Billy's data is scored completely for only the first two days in Figure 1, but the hypothetical total-correct squares have been drawn and connected for the full eight days. The result is that a linear graph is formed across the block. As can be seen from Billy's recording block, the total number of correct responses per day is above criterion (above the indicator line) on the eighth day of training. If for Billy, the

criterion for changing programs was "one day of more than 80% correct," his program would be changed on the next day.

Whereas, in Figure 1, the recording blocks for Susan and John have been used to demonstrate other scoring variations, often the data sheet would be used in cases where all three students are working on the same task. In order to insure that a new sheet is started for all three students simultaneously, when a student is absent or misses a training period, the column assigned to that data is not used. The square of the day preceding the absence is connected directly to the square of the day subsequent to the absence. Thus, the data sheet is completed for all three students on the same day.

Whereas, for photographic purposes, squares are used in Figure 1 for indicating total number correct, in actual practice, squaring or circling the numeral with a felt-tip pen of a bright color produces a more visually clear graph.

Variations on the primary method of using the data sheet are possible and two of these variations are shown in the recording blocks for Susan and John in Figure 1. The data represented in Susan's block depicts a case in which the teacher has recorded the responses on two separate aspects of a counting task. In this case, the two instructions are "Give me_____," and "How many _____ do you have?" Susan received 40 trials per day on this task. Correct and incorrect responses are recorded the same as for Billy, but the graphing is done such that the responses to the two different aspects of the task are graphed separately. The squares marking total correct responses per day are connected between the columns of a particular aspect of the task, rather than

being connected between each adjacent column. References to what is recorded in the various columns is entered in the tilted-line spaces. Thus, the teacher is able to monitor the acquisition of the two responses separately. As with Billy's data, only a portion of the actual daily data is shown, but the hypothetical total correct squares for all four days are shown.

The recording in John's block represents a system considerably different from the two preceding students. In this case, the teacher has been teaching John to identify eight different colors and has been interested in monitoring his performance on each color separately. With this method, the number of trials or attempts per day may vary from day to day or may be held constant. The teacher records correct and incorrect responses in the same way as in the previous cases. When the recording block is filled, the total number of correct responses on each color is squared, and the squares are connected forming a frequency polygon, giving a visual picture of frequency of correct responses on the various colors. When this method of recording is used, the teacher refers to the developing pattern of correct responses in each column to gain information about changing acquisition rates on the various colors. Only a portion of John's actual data is shown in Figure 1.

These three variations in the use of the data sheet are but a small sample of the total number of variations which have been employed by the several teachers currently using this system. Most of these variations occur when the teacher wishes to record several different responses, several aspects of the same response, or when different tasks are taught on alternating days. Students' responses on such tasks as matching-to-sample, object or picture naming, instruction following, imitation,

answering questions verablly, printing and drawing, and self-help programs have all been handled easily with this data sheet.

Continuation graphing beyond the eight day limit is also possible with this data sheet using a quick and easy "cut and tape" procedure. When a data sheet has been used completely, the recording blocks are cut apart such that the student's name above the comments below are left attached to the block. The dissected block is then taped to the block cut from the previously completed data sheet. The taping is done so that the numerals of one block align with the numerals of the subsequently completed block. By following this procedure, the teacher retains a continuing graph of the student's performance on a particular task, complete with name, date, and commentary information. In using this procedure in combination with the scoring and graphing methods described above, no other tabulation sheets, summary sheets, graphs or other calculations are required to provide the teacher with a comprehensive picture of the student's performance.

Other modifications and variations of both the format and use of the data sheet have proved useful. When more than three students have been involved in training groups, data sheets similar to that shown in Figure 1 have been prepared on reproduction masters which contain recording blocks for four, five, or six students. Whereas the data sheet shown here was developed for four-day weeks, and thus contains eight columns per recording block to cover a two-week span, other sheets can be prepared with five or ten columns per block. In other instances, teachers have requested sheets with 10, 12, or 15 numerals per column to accommodate differing trials-per-day situations. Other teachers have

simply used only the first 10 or 12 numerals on the sheet presented here. Provided the number of trials per day remains consistent, the graphic effect and the utility of the indicator line are not altered. Still other teachers have found it possible, using expanded scoring systems, to record more than one response in a single column. At the end of the day, these teachers indicate total correct responses on the two responses with two different symbols, e.g. a square and a triangle, or differently colored squares.

Discussion

Based on the continuing feedback from the teachers currently employing this data sheet and its accompanying procedures, it would appear that many of the desired characteristics discussed earlier are inherent in this design. The composite nature of the sheet and the simple scoring system make the sheet easy to use by a teacher working alone with a group of students. Scoring is rapid and uncomplicated and provides feedback to the teacher which facilitates her pace of instruction and her monitoring of the training session length. The recording of responses of several students is accomplished on a single page as is the graphing of each student's performance. As shown in Figure 1 and as elsewhere suggested, the sheet can be used for recording the behavior of students on a wide variety of tasks, using different numbers of trials per day. Graphing the daily performance of three students requires less than 60 seconds per task and the continuation graphing procedure requires about the same length of time. The consolidation of scoring and graphing on the same sheet also reduces the amount of different materials

and storage space required to handle the clerical aspects of data based teaching strategies.

Although this data sheet is not appropriate for all types of recording, especially time-based recording of free-operant responding, it is clear that its simplicity, utility and versatility make it a convenient instrument for use in the classroom. This seems especially true in cases where one teacher is attempting to provide a functional training program for several students simultaneously.